

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P032909WO:BRC	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/GB2004/000016	International filing date (day/month/year) 07.01.2004	Priority date (day/month/year) 16.01.2003
International Patent Classification (IPC) or national classification and IPC C08J7/04, A01N25/10, A01N59/16, A01N59/26, C09D5/02		
Applicant DUPONT TEIJIN FILMS U.S. LIMITED PARTNERSHIP		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 1 sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 13.09.2004	Date of completion of this report 20.04.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Niaounakis, M Telephone No. +31 70 340-3818 	

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/GB2004/000016

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-21 as originally filed

Claims, Numbers

2-23 as originally filed
1 received on 04.04.2005 with letter of 01.04.2005

Drawings, Sheets

1/1 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-23
	No: Claims	
Inventive step (IS)	Yes: Claims	1-23
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-23
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The Applicant's observations submitted with amended claim 1 has been carefully considered and accepted for the following reasons:

Amended claim 1 relates to an anti-microbial polymeric film comprising a polymeric substrate layer and a polymeric coating having a thickness of from about 0.01 to about 14.0 μm and comprising an anti-microbial compound in an amount of from 0.1 to about 50% by weight of the coating layer, said coating provides: i) a heat-seal strength of 100-2500 g/in when heat-sealed to itself; ii) a barrier to water vapour and/or oxygen, such that the water vapour transmission rate is in the range of 0.01-10g/100 inches²/day and the oxygen transmission rate is in the range of 0.01-10 cm³/day/atm; iii) said antimicrobial film exhibits a greater than 1 log reduction in the growth of a population of microbes. Amended claim 1 is now adequately defined since all the "functional" parameters of claim 1 are now expressed in quantitative terms.

Reference is made to the following document:

D1 : EP 0 846 418 A (TOYO BOSEKI) 10 June 1998 (1998-06-10)

D1 relates to an antibacterial film prepared by coating an anti-bacterial composition to a base layer, preferably PET (claims 1, 13, 15-17, example 23). The thickness of the formed film is about 0.3 μm (example 23). The antibacterial composition comprises an antibacterial agent, which is an inorganic compound containing silver, copper or zinc and is present in amount of 5% by weight or less (claim 3; page 9, lines 9-10). The preferred average diameter of the antibacterial particles is 0.01 to 5 μm (page 9, lines 11-12). The polymer of the coated film can be polyvinyl alcohol, PVA (Table 12; examples 48, 52). However, the PVA component in D1 is present as an additive, at 5 parts by weight to a PET base. In addition, there is no mention or suggestion in D1 over the coated film's sealant or barrier properties. In any case, the coated film of D1 will not satisfy the barrier and sealant requirements required by claim 1 of the present application, because these properties are not inherently achieved by D1. Therefore, the subject-matter of claims 1-23 is novel (Article 33(2) PCT).

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(SEPARATE SHEET)**

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The distinguishing technical features of the present application with reference to the prior art are the barrier and sealant properties of the coated film above certain threshold levels. The effects of this technical feature is an anti-microbial film exhibiting barrier properties to moisture and/or oxygen, which are sufficient for packaging applications and also is heat-sealable. The problem to be solved is a anti-microbial polymeric film showing these effects. The solution to the problem is claimed to be the use of the anti-microbial film of the present invention. The solution to the problem posed is not obvious as neither D1 nor any of the cited documents even discusses this problem, let alone provide any basis for obtaining the Applicant's solution. The invention is, therefore, inventive (Article 33(3) PCT)

Furthermore, all claims fulfill the requirements of industrial applicability (Article 33(4) PCT).

CLAIMS

1. An anti-microbial polymeric film comprising a polymeric substrate layer having a first and second surface and on a surface thereof a polymeric coating having a thickness of
5 from about 0.01 to about 14.0 μm and comprising an anti-microbial compound in an amount of from about 0.1 to about 50% by weight of the coating layer, characterised in that
(i) said coating provides a heat-seal strength of from 100 g/in to 2500 g/in when heat-sealed to itself and/or (ii) said coating provides a barrier to water vapour and/or oxygen, such that the water vapour transmission rate is in the range of 0.01 to 10g/100 inches²/day
10 and the oxygen transmission rate is in the range of 0.01 to 10 cm³/100 inches²/day/atm, < >
2. An anti-microbial film according to claim 1 wherein the anti-microbial compound is in particulate form.
- 15 3. An anti-microbial film according to claim 1 or 2 wherein the anti-microbial compound is present in an amount of from about 0.1 to about 5%
4. An anti-microbial film according to claim 1, 2 or 3 wherein the anti-microbial compound is an inorganic compound containing a metal or metal ions selected from silver,
20 copper, zinc, tin, mercury, lead, iron, cobalt, nickel, manganese, arsenic, antimony, bismuth, barium, cadmium and chromium.
5. An anti-microbial film according to claim 1, 2 or 3 wherein the anti-microbial compound has the formula $M^1_a H_b A_c M^2_2 (PO_4)_3 \cdot nH_2O$ wherein:
25 M^1 is at least one metal ion selected from silver, copper, zinc, tin, mercury, lead, iron, cobalt, nickel, manganese, arsenic, antimony, bismuth, barium, cadmium and chromium;
A is at least one ion selected from an alkali or alkaline earth metal ion;
 M^2 is a tetravalent metal ion;
a and b are positive numbers and c is 0 or a positive number such that $(ka + b + mc) = 1$;
30 k is the valence of metal M^1 ;
m is the valence of metal A; and
 $0 \leq n \leq 6$.

< , and (iii) said antimicrobial film exhibits a greater than 1 log reduction in the growth of a population of microbes. >